SCIENCE

VOL. 88 FRIDAY, SEPTEMBER 30, 1938 No. 2283

The American Association for the Advancement of Science:
The Land Utilization Program in the Southern Great Plains: E. D. G. ROBERTS 289
Obituary:
Otto Hilgard Tittmann: DR. WILLIAM BOWIE. *Recent Deaths and Memorials* 292
Scientific Events:
Sectional Issuance of Biological Abstracts; The Allan Hancock Foundation Building for Biological Research; The Squibb Institute for Medical Research; Medical Symposia at Duke University; The International Society of Sugar Cane Technologists 294
Scientific Notes and News 296
Discussion:
Light Eyes and Glare Sensitivity: DR. HARRY R. DESILVA and PHILLIP ROBINSON. *On the Citation of Authorities for Botanical Names:* DR. ROBERT T. CLAUSEN. *Bacterial-Plant Group of Dhaincha:* M. S. RAJU 299
Scientific Books:
A Biography of Claude Bernard: PROFESSOR J. F. FULTON 300
The American Association for the Advancement of Science:
Symposium on Mental Health: DR. MALCOLM H. SOULE 302
Special Articles:
Recovery of Eastern Equine Encephalomyelitis Virus from Brain Tissue of Human Cases of Encephalitis in Massachusetts: DR. LESLIE T. WEBSTER and DR. F. HOWELL WRIGHT. *The Production of a Gonadotrophic Substance (Prolan) by Placental Cells in Tissue Culture:* DR. GEORGE O. GEY, G. EMORY SEEGAR and LOUIS M. HELLMAN. *The Cold Water Layer of the Scotian Shelf:* H. B. HACHEY 305
Science News 8

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal
Lancaster, Pa. Garrison, N. Y.

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE LAND UTILIZATION PROGRAM IN THE SOUTHERN GREAT PLAINS[1]

By E. D. G. ROBERTS

CHIEF, LAND POLICY SECTION, SOUTHERN GREAT PLAINS REGION, BUREAU OF AGRICULTURAL ECONOMICS, U. S. DEPARTMENT OF AGRICULTURE

THE circumstances which have brought about the present distressing condition in which much of the Southern Great Plains region finds itself have, of late, received a great amount of publicity and are so well known that I shall content myself with presenting merely an outline of the chain of circumstances which have transformed some of the finest grazing land in the country into what is now being called the "dust bowl."

It has been said that the history of the Southern Great Plains region has been, for the past 60 years, a story of exploitation. A half century of over-grazing by some cattlemen was bad enough, but the damage they did was nothing compared to what happened during the 1920's. High wheat prices, favorable moisture conditions, and the introduction of farm machinery did the job. The residents were too busy making money to remember that earlier experiments in speculative dryland farming had not produced altogether happy results. The inevitable drought finally came, and with it came disaster.

The settlement of much of the Great Plains took place in accordance with a policy which was destined to place the largest portion of the area under private control as expeditiously as possible. The Federal Government, the state and territorial governments, the railroads and the multitude of speculators all desired to bring settlers into the country. The Homestead Laws have had a great deal to do with hasty settlement.

[1] Address at the meeting of the Southwestern Division of the American Association for the Advancement of Science, Albuquerque, N. Mex., April 25, 1938.

They propagated the idea that 160 or 320, and later 640, acres of land were sufficient on which to make a living. They placed stress upon "improving" the land which, in this case, of course, meant to bring it into crops. Thus, it was attempted—and, in the beginning with a measure of success—to produce crops on land that was suited only for pasture. The farming methods and the climatical conditions were such that this procedure became extremely hazardous, and finally led to severe depletion of the land resources. The results were disastrous, from any angle one chooses to look at them. The system of agriculture which has been put into operation disregards entirely the natural conditions. A few seasons with plentiful moisture will not bring prosperity back. The problem goes much deeper than that. It is necessary to restore the balance which has been upset—a balance which was disturbed in but a few years and which it will take a long time to restore. Droughts, with their consequences of erosion, have left in their wake hundreds of thousands of acres of damaged and abandoned land, and have brought about wholesale impoverishment of farmers in certain sections of the region. Great areas depend for their very existence upon government subsidies, and the old-time stockman, and even the old-time farmer who lived on his own homestead has largely disappeared. Instead, we find a new type of migratory tenant farmer whose principal means of subsistence is derived from federal subsidies—the average expenditure of federal monies has been in excess of $300 for every man, woman and child in the 14 southwestern Kansas counties alone.

During the years between 1890 and 1895, when a severe drought prevailed in these areas, attention was temporarily directed toward more sensible land-use practices. It was then realized that in the Great Plains an agricultural economy, based solely upon cash crops, was hazardous, if not hopeless. These lessons were forgotten only too soon. At present, popular opinion has again swung toward recognition of the fact that most of these areas are not suitable for cash crop production, although this popular thinking is very often obscured by the influence of certain commercial interests which favor the type of program which would immediately bring the greatest amount of money to the towns. Some of them favor continued loans for the planting of wheat in the hope that with good moisture conditions bumper crops may again be harvested. The argument is heard that one good crop would make up for many failures; that conservation policies such as return to grass would accentuate emigration, etc. Unfortunately, these interests are in a position to make their viewpoints prevail, in the face of evidence which nature accumulates on their very doorsteps. The long-range effect of the type of program that they would favor is apparently lost sight of now, as it was in the nineties.

Conditions are, of course, very dissimilar from what they were in the late nineties. Most of the land is in private hands and a great deal of it is owned by absentee landlords (in some counties, almost half of it), whose main income is derived from other sources. Community patterns, with their governmental and civic organizations, have been set up, and a great deal of capital has been invested. Real estate companies and their agents have sold vast tracts of land to investors as far distant as the Atlantic seaboard. Towns have sprung up and multitudes of services have been established. Lately many of these services have been withdrawn, including school facilities, postal service and certain local business enterprises. For a while, the contentions of the various promoters seemed to be borne out by a combination of bountiful crops and good prices which were obtained during the war and post-war years. The population increased very rapidly and so did the area under cultivation. Then the weather cycle moved and several dry years followed, with the resulting catastrophic conditions which are, in some instances, beyond the power of description. Crops became complete failures, taxes, mortgages, etc., became delinquent, and the highways were crowded with farmers who drifted away as they had drifted in. Fiscal conditions, while extremely precarious, do not present a real picture, since the federal land bank and the insurance companies keep taxes paid on all lands on which they hold mortgages. The true effects of the situation are cushioned to a very great extent by governmental policies which have put a stream of federal monies, subsidies, grants and loans of every description into these areas. What would have happened without them is hard to say. But there is no doubt that emigration and abandonment of farmsteads and towns would have been accentuated and that human misery would have increased immensely. Some authorities, as a matter of fact, insist that the relief of human misery is the only justification for the millions expended in these areas; they state, with considerable evidence to back them up, that much of this money served only to encourage harmful practices and that, from a purely physical point of view, the country would have been better off if it had been permitted to find its own level. Increased abandonment would have left the fields to weeds and grass, and some sort of cover would have been restored. Instead of that, various types of subsidies financed such practices as breaking up the land year after year in a futile endeavor to raise wheat.

At present, there are wide areas unfit for agricultural pursuits of any kind, and it is doubtful whether some of them would revert to grass or even weeds without re-seeding and mechanical assistance, even

under ideal conditions. Much more is now known about the soils of the region than was known a few years ago. The region as a whole contains approximately 100,000,000 acres, of which about one third have been put into cultivation. About twelve to thirteen million acres are deep, heavy High Plains soils, extending through sections of western Kansas, the Oklahoma Panhandle and the Plains of Texas. These soils are very fertile and of such a character that they respond readily to water-conserving and crop-management practices. In view of the extremely severe conditions that have prevailed, they have been only moderately affected by wind erosion. These soils could be brought under control by the use of contour tillage, summer fallowing or the use of proper crops, practices that would increase the rate of water penetration into the soil and would also distribute the moisture more equally. Even on such soils, farmers should take care that their economy is flexible enough to take care of the years when wheat crops would be a complete failure. Experiment stations have established the fact that it is folly to plant wheat when at the time of planting the soil moisture is less than 24 inches.

There are approximately six million acres of medium-depth sandy soils in the region. About 20 per cent. of these lands have been so seriously damaged that they will have to be retired from cultivation. If farmed properly, such soils are excellent for the production of row crops, but this type of land is extremely susceptible to wind erosion if not properly managed.

The third group of soils is the medium type, High Plains soil found in eastern Colorado and western Kansas. Such lands do not hold water well, and the run-off is very high. About four million acres of such soils are under cultivation now, most of them badly eroded. This land should be used for grazing purposes.

Finally, there are certain types of sandy soils which never, under any circumstances, should have been placed under cultivation. Some are too sandy for crop production and others are too shallow and have no capacity for water storage.

Thus, one of the primary tasks which confronts us is to retire some six million acres from crop production. There are considerable areas where mere retirement would be insufficient. Mechanical aid will have to be used to restore cover to these lands.

The Department of Agriculture has felt that a problem of such dimensions, which in its ultimate effects is bound to have wide repercussions upon the entire nation, could be properly handled only if the efforts of the department and its various agencies were combined and harmonized by a coordinator. A unity of program and the exchange of information among such agencies as the Soil Conservation Service, the Farm Security Administration, the Forest Service, the Bureau of Agricultural Economics and the AAA, is bound to facilitate this cooperation very greatly. Under this program other agencies, such as the Extension Service of the various state colleges and the various units of the Farm Credit Administration, are sending their representatives to planning meetings and conferences which already have brought about some very desirable results. Data have been secured by the research divisions of these many agencies pertaining to soil and land classification and to water resources. Economic and sociological surveys have been made by the former Land Use Planning Division of the Resettlement Administration, and innumerable maps, charts and data are available, giving detailed analyses of the land-use facilities, fiscal conditions and credit, school district and tax situations of the various counties of the Dust Bowl. Funds for the purchase of submarginal lands have been made available under Title III of the Bankhead-Jones Act. Under this program, the government purchases lands in the worst areas and retires them from use and, after cover is restored, permits them to be used by local grazing associations. Leases also will be granted to individuals, but governmental supervision will be retained. The Farm Security Administration, through its loans to farmers made contingent on a well-balanced farm plan, as well as upon sufficient soil moisture where loans are made for crop purposes, plays an extremely important rôle. This will be particularly the case when the long-term leases, which are designed to increase the size of units now too small to afford a living to a family, go into effect.

The machinery through which many of these adjustments are expected to be brought about is the Soil Conservation District, of which a number are being set up in the various states. It is the plan of the various agencies to fit their individual programs, with local cooperation, into the programs of these districts. The main obstacle will be overcome as soon as the public is educated to the ultimate benefits to be gained through cooperation. Through this democratic process, it is desired to make the program indigenous and adaptable to the area rather than have it imposed upon the population by Washington decree. Still, in some quarters, it is felt that real progress with respect to the necessary adjustments will be made only when either the local governmental units or the Federal Government will be in a position to control the land through ownership, lease or powers such as the Soil Conservation Districts exercise. Zoning laws, such as exist in Wisconsin, for example, are one approach which has proved effective. Although a great deal of further research is necessary, we have much of the technical knowledge necessary to rehabilitate the area, purely from a physical point of view. Great complications arise when we contemplate how to develop farm

units which will insure the farmers of the area at least a living, even during the bad years. The farm management experts of the department are devoting a great deal of effort to the solution of this problem. The Soil Conservation Service and the Bureau of Agricultural Economics are both endeavoring to bring about the necessary mechanical and physical adjustments at a cost which can be borne by the farmers.

The Bureau of Agricultural Economics which, through its Land Utilization Program, administers the provisions authorized under Title III of the Bankhead-Jones Farm Tenant Act, maintains regional offices at Amarillo, Texas. The region comprises the states of New Mexico, Kansas and Colorado, and parts of Texas and Oklahoma. Its Land Economics staff is engaged in research work to study the long-range phases of the program. It also functions as a service organization to assist those staff members who are engaged in action programs. Studies carried on include land classification, soil reconnaissance, range studies, public finance and agricultural credit, flood control and underground and surface water studies. A staff of state planning specialists, with offices in each state of the region, assists in keeping in close touch with local programs and with the state colleges. The Farm Management staff of the bureau conducts intensive studies designed to enable the bureau to present recommendations for well-balanced farm plans. The Project Organization staff prepares plans and submits purchase projects; the Land Acquisition staff secures options and acquires the land. The Land Development staff is engaged in supervising the building of numerous dams and will have charge of the development work on the purchase projects; at present it is also engaged in development work on the old land use projects.

The Agricultural Adjustment Administration can eliminate a great many of the present difficulties by making its payments contingent upon the performance of soil-conserving practices.

The states and local governmental units have a responsibility in this matter which, so far, many of them have failed to meet. Many land owners would restore their land to grass if they were not discouraged from doing so by the tax situation which prevails. There should be a wide differentiation between the tax rates on regular crop land and on that which is more suitable for grazing land.

A more responsible ownership of land must be brought about if any improvement in land use is to be achieved. The present pattern of ownership is conducive to the worst kind of land use. The proportion of non-resident land ranges from 50 per cent. in some of the southwestern Kansas counties to as high as 83 per cent. in others. Land operated by non-resident owners is generally abused. The same applies, to a certain extent, to the tenant farmer who, because of his short lease, must plan his operations on a year-to-year basis, and is not, therefore, interested in a sound and efficient farming program. These are important factors causing the exploitation rather than the conservation of the soil. The Farm Tenancy Program is expected to play a very important part in the restoration of land ownership. Although only a small beginning is being made at present, it is considered a step in the right direction. The delineation of problem areas is proceeding. Such areas are being designated on the basis of soil reconnaissance, present land use, underwater facilities and fiscal conditions. Much of the research is carried on in cooperation with the local state colleges. A wise use of the credit opportunities provided by the Federal Government and other agencies will be important in restoring the land to a self-sustaining basis. With land purchases within the Soil Conservation Districts as nuclei, with agreements with states and large landholders, with demonstrations to farmers of what a well-designed land utilization program can do, it is hoped that effective adjustments will be brought about. That this will take considerable time is obvious, but it is hoped that the lessons learned will not be forgotten too soon, and that the demonstrations will prove effective in bringing about improved land use adjustments.

OBITUARY

OTTO HILGARD TITTMANN

OTTO HILGARD TITTMANN was born at Belleville, Ill., on August 20, 1850, and died at Leesburg, Va., on August 21, 1938. He was buried at the latter place on August 24.

He entered the service of the U. S. Coast Survey (later designated the U. S. Coast and Geodetic Survey) in 1867 and was assigned to field duty. As a result of his strict attention to the tasks assigned him he rose to the position of superintendent of the survey in 1900 and remained in this capacity until his resignation in 1915, after 48 years of service.

Among his important assignments were those of assistant astronomer with the expedition sent to Japan in 1874 to observe the transit of Venus; in charge of the Office of Standard Weights and Measures from 1887 to 1895; assistant in charge of the office from 1895 to 1899; assistant superintendent, 1899 to 1900; member of the Permanent Commission of the International Geodetic Association from 1901 to 1915; and delegate, representing the United States, to the meetings of that association in 1895, 1903, 1906, 1909 and 1912.

In addition to his duties with the Coast and Geo-

detic Survey, Dr. Tittmann took a leading part in the location, survey and monumentation of the boundaries between the United States and Canada and between Canada and Alaska. In 1903 he went to London, England, as a technical expert for duty in connection with the presentation of the case of the United States before the Alaska Boundary Tribunal. In 1908 he was appointed the sole commissioner for the United States, under the treaty of 1908, which clarified and amplified certain portions of previously executed treaties relating to the boundaries of this country, Canada and Alaska. He continued to serve as commissioner until his retirement in 1915.

Under Tittmann's supervision the greater part of all our northern boundaries was surveyed or resurveyed, adequately monumented and mapped. The technique for boundary surveying developed under his direction has become the model for boundary surveying and demarcation. He wisely demanded that the geographic positions of all boundary points should be determined by geodetic surveying methods, and that they should be firmly monumented or referenced. The splendid work on our boundaries inaugurated by Tittmann and his Canadian associate, W. F. King, has been continued by their successors. There are no other countries of the world having common boundaries that are so fortunate as our country and Canada in regard to their boundaries. The commissioners settle in an amicable manner any disputed points concerning the lines, and the citizens have no difficulty in knowing just where the boundaries are. Our northern boundaries are monuments to Tittmann's career of public service.

While he was superintendent of the Coast and Geodetic Survey, that organization made great progress in the development of instruments and methods for carrying on its engineering and scientific work, and in the interpretation of the data secured in the office and field. Among the noted accomplishments may be mentioned the following:

The adoption of the United States Standard Datum for the triangulation system of this country and incidentally also for the charts of the coasts and the maps of the interior. This datum was, in 1913, adopted also by Canada and Mexico, when, on account of its international character, it was designated the North American Datum. North America is the only continent that has a single system for its horizontal control surveys, charts and maps. This avoids the gaps, overlaps and offsets that exist in the maps and charts of the countries of other continents. Such confusion at times leads to controversies over the location of international boundaries.

The determination of the figure of the earth from geodetic measurements and data for the area of the United States. Its dimensions were accepted in 1924, as the most accurate ones, then existing, by the International Geodetic Association. This figure of the earth is still the international standard.

The proof of isostasy. Before Tittmann's administration of the Coast and Geodetic Survey isostasy was considered to be an unproved hypothesis. It is now recognized as a scientific principle, and is now given consideration by workers in the fields of theoretical and economic geology and geophysics.

The development of the theory of tides and the epoch-making reports on this subject by Rollin Harris, a mathematician of the Survey.

The development of the wire drag or sweep, by means of which many large boulders, pinnacle rocks and coral heads were discovered in our coastal waters. These objects had been menaces to navigation. They could not be readily found by the customary hydrographic methods.

The development of a precise levelling instrument that was free from the effects of troublesome systematic errors.

The completion of the Tide Prediction Machine, which made it possible to predict tides with great accuracy and with far less effort and time than had been required previously.

The inauguration of a comprehensive gravity survey, whose purpose is to furnish accurate values of gravity to those working in the physical and chemical sciences, and to those testing isostasy.

The inauguration of the use of invar tapes for the measurement of geodetic base lines.

The building and operation of five magnetic observatories as our part of a comprehensive international attack on some fundamental problems in the field of terrestrial magnetism.

Tittmann was thoroughly imbued with the scientific spirit and he imparted this to the members of the engineering and scientific staffs of the Survey.

As a recognition of his achievements he was awarded the degree of Sc.D. by Stevens Institute and Washington University and the degree of LL.D. by George Washington University. He was one of the original incorporators of the National Geographic Society and its president from 1915 to 1919; a member of the Philosophical Society of Washington and its president in 1899; a member of the Cosmos Club of Washington, D. C., and its president in 1904. He was also a member of the Washington Academy of Sciences, the American Society of Civil Engineers, the American Meteorological Society and the American Association for the Advancement of Science.

Dr. Tittmann was a gentleman in the best sense of that word, a public official of the highest character, whose sole object was to serve his country to the best

of his ability, a delightful comrade and a true friend. Those who had the pleasure of knowing him will never forget his unselfishness, fairness and unfailing courtesy.

He is survived by his son, Major Charles Trowbridge Tittmann, of Washington, D. C. Dr. Tittmann's wife died at their home in Leesburg on February 14 of this year.

WILLIAM BOWIE

RECENT DEATHS AND MEMORIALS

DR. ALEXANDER FRASER, professor of pathological histology at the New York University College of Medicine from 1920 until his retirement in 1934, died on September 18 at the age of sixty-nine years.

DR. JAMES ERNEST BOYLE, professor of rural economy at Cornell University, died on September 18. He was sixty-four years old.

SIR ANDREW MACPHAIL, from 1907 until his retirement in 1937 professor of the history of medicine at McGill University, died on September 23 at the age of seventy-three years.

DR. SAMUEL ALEXANDER, honorary professor of philosophy in the University of Manchester, died on September 13 at the age of seventy-nine years.

Nature reports the death of M. de la Baume-Pluvinel, member of the section of astronomy of the Paris Academy of Sciences, on July 18, aged seventy-seven years, and of Sir Basil Mott, president in 1924 of the British Institution of Civil Engineers, on September 7, aged seventy-eight years.

THE *Journal* of the American Medical Association reports that during the recent Congrès des sociétés savantes, a plaque in commemoration of the work of the late Professor Brown-Séquard was placed in the lobby of the Central University at Nice. Before Brown-Séquard's election as professor of experimental and comparative pathology in the University of Paris, he had been professor of the pathology of the nervous system at Harvard University and was subsequently a member of the attending staff of the Paralyzed and Epileptic Hospital in London.

SCIENTIFIC EVENTS

SECTIONAL ISSUANCE OF BIOLOGICAL ABSTRACTS

A NEW plan for the publication of *Biological Abstracts,* beginning with 1939, has been adopted by the Board of Trustees. It provides for continuation of the monthly issues covering the literature of all the life sciences with increasing completeness and promptness at a uniform price of $25 to libraries and individual subscribers, alike. In addition, specialized sections of each monthly issue of *Biological Abstracts* will be published separately so that those who do not feel the need for the complete publication may acquire at low cost the sections in which they are especially interested. The sections adopted as seeming to promise the greatest usefulness are the following:

Abstracts of General Biology to include General Biology, Biography-History, Bibliography, Evolution, Cytology, Genetics, Biometry and Ecology. $4.

Abstracts of Experimental Animal Biology to include Animal Physiology, Nutrition, Pharmacology, Pathology, Anatomy, Embryology and Animal Production. $9.

Abstracts of Microbiology and Parasitology to include Immunology, Bacteriology, Viruses, Parasitology, Protozoology and Helminthology. $5.

Abstracts of Plant Sciences to include Phytopathology, Plant Physiology, Plant Anatomy, Paleobotany, Systematic Botany, Agronomy, Horticulture, Forestry, Pharmacognosy and Pharmaceutical Botany. $6.

Abstracts of Animal Sciences to include Paleozoology, Parasitology, Protozoology and Helminthology, Systematic Zoology and Economic Entomology. $6.

Subscribers to any of these parts will receive the indexes to the whole of *Biological Abstracts.*

The subscription prices quoted above are for the United States. Subscription rates for other countries will be announced at an early date.

The extent of coverage must, of course, depend on the extent of support. With no national society treasury to draw upon, this must be so. To insure publication a minimum of 1,250 subscriptions to the complete edition and four times as many orders for section issues are required.

In order to facilitate the plans for 1939, subscription blanks will shortly be distributed throughout the membership of the societies composing the union as well as to libraries and institutions generally. It is hoped that as large a response as possible by November 1st may be recorded in the office of the Business Manager, *Biological Abstracts,* University of Pennsylvania, Philadelphia, Pennsylvania.

BOARD OF TRUSTEES,
Biological Abstracts

THE ALLAN HANCOCK FOUNDATION BUILDING FOR BIOLOGICAL RESEARCH

AT the University of Southern California ground has been broken for the new Allan Hancock Foundation building for biological research, the gift of Dr. Allan Hancock.

The building will be three stories and will contain over a hundred laboratories for scientific research in

zoology, botany and related fields. Private quarters will be provided for independent study as well as for students and graduate workers. Included in the collections of the university are several thousand specimens gathered on the seven Hancock Pacific expeditions to equatorial waters and the Galapagos Islands. Extending six stories from the basement will be a series of steel stacks designed against fire and earthquake, to preserve these rare specimens.

There will be two auditoriums seating 450 and 150 persons each, radio broadcasting rooms connecting all buildings, x-ray rooms, machine and wood shops and special laboratories.

Four rooms from the former Hancock mansion, recently demolished, have been moved intact and incorporated in the new building; these will form the nucleus of music, reception, library and exhibition rooms. Done in marble and carved woodwork by artisans of Europe, this portion of the building will serve the community as a cultural center for lectures and recitals, and for scientific demonstration purposes.

THE SQUIBB INSTITUTE FOR MEDICAL RESEARCH

AN attendance of a thousand scientific men is expected at the ceremonies dedicating to pure science the laboratory building which has been erected at a cost of $750,000, of the new Squibb Institute for Medical Research in New Brunswick, N. J., on Tuesday, October 11. Dr. George A. Harrop is director of the institute. The exercises will open with a reception at 12:30 P.M., followed by a luncheon meeting at 1 P.M., and will close with an inspection of the building from 3:30 to 5:30 P.M.

Professor August Krogh, director of the department of animal physiology at the University of Copenhagen, Denmark, and Dr. George R. Minot, professor of medicine at Harvard University and director of the Thorndike Laboratory of the Boston City Hospital, will be among those who will deliver addresses at the luncheon. Other speakers will be: Dr. Abraham Flexner, director of the Institute for Advanced Study, Princeton, N. J.; Dr. Russell Morse Wilder, professor of medicine in the Mayo Clinic, Rochester, Minn.; Carleton H. Palmer, president of E. R. Squibb and Sons, and Dr. John F. Anderson, vice-president and director of the Biological Laboratories of E. R. Squibb and Sons.

Dr. Krogh, Nobel laureate of 1920 for his work on the capillary regulation of blood supply in muscle, will discuss "Biology and Medicine in Cooperation." Dr. Minot, who shared the Nobel award in medicine in 1934 for his researches on the value of liver in the treatment of pernicious anemia, will speak on "Clinical Investigation," and Dr. Wilder will speak on "Industrial Laboratories and Clinical Research." The program will be concluded by Dr. Flexner, whose topic will be "The Usefulness of Useless Knowledge." The address of welcome will be given by Mr. Palmer, while Dr. Anderson will outline the aims of the institute as a pioneer undertaking of the pharmaceutical industry in promoting research in the medical and biological sciences. The speakers will be introduced by Dr. Harrop.

Sherley W. Morgan, professor of architecture at Princeton University, is architect of the building. It is U-shaped with a three-story main building flanked by side wings of two stories each. Usable floor space aggregates 52,000 square feet. Provision has been made for the immediate utilization of 100 rooms, seventy of which are individual laboratories and individual offices.

Construction is of steel, concrete and glass with complete insulation from outside weather conditions assured by walls fourteen inches thick, evacuated glass brick windows and air-conditioning equipment. The building rests on concrete footings reaching down to the Jersey red shale.

The institute will be in full operation this autumn. Research has been organized in four main divisions—experimental medicine, pharmacology, bacteriology and virus diseases and organic chemistry. In addition, the institute will operate a biochemical laboratory and a medicinal chemistry laboratory. The aim of the founders of the institute is to create in the medical and biological fields an industry-supported research enterprise analogous to the Bell Telephone and General Electric laboratories in the sphere of physics.

MEDICAL SYMPOSIA AT DUKE UNIVERSITY

THE first symposium in the series to be conducted in observance of the centennial year of Duke University will be held from October 13 to 15, and more than five hundred Southern physicians are expected to hear the twelve leading medical authorities who will appear on the program.

Attention during the three days will be focused on two problems, "The Future of American Medicine," to be discussed by Henry L. Mencken, contributing editor of the *Baltimore Sun*, and Dr. Morris Fishbein, editor of the *Journal* of the American Medical Association, and others, and "Diseases of Special Interest to Physicians in the Southern States," in a discussion of which a number of specialists will participate.

Three other symposia will be held during November, December and March. They will be on "The New Economic Base of the South," "The Law and Modern Society" and "Women and Contemporary Civilization." Foremost authorities in each field will be heard.

The symposium on medical problems will be the fifth annual symposium held at the School of Medi-

cine. The first in the series was held in 1934 on orthopedics. During the next two years gastro-intestinal diseases and diseases of the heart, kidney and circulation were discussed. The symposium last year was on the diseases of women and children.

First speakers and their subjects for the forthcoming symposium will be: Dr. Allen Weir Freeman, dean of the School of Hygiene and Public Health, the Johns Hopkins University, "Public Health Development in the South," and Dr. George W. McCoy, of the School of Medicine of Louisiana State University, "Leprosy in the United States."

Three speakers will discuss "The Future of American Medicine" in the first evening session. They will be: Henry L. Mencken, of Baltimore; Dr. John Punnett Peters, professor of medicine, Yale University, and Dr. Morris Fishbein, editor of the *Journal* of the American Medical Association. Dr. Milton J. Rosenau, of the School of Medicine of the University of North Carolina, will preside.

The subsequent speakers on the symposium program will deal with more technical subjects of interest to Southern physicians. These speakers will be: Dr. George Hoyt Whipple, dean of the University of Rochester and a Nobel laureate, "Anemia and the Building of Hemoglobin in the Body"; Dr. William Henry Sebrell, surgeon in the U. S. Public Health Service, "Pellagra"; Dr. Charles F. Craig, of the Medical School of Tulane University, "Amebiasis"; Dr. Edward W. A. Ochsner, of the Medical School of Tulane University, "The Surgeon's Contribution to Treatment of Amebiasis"; Dr. William G. MacCallum, of the School of Medicine of the Johns Hopkins University, "Malaria"; Dr. Arturo Lorenzo Carrión, Columbia School of Tropical Medicine, Rio Piedras, Puerto Rico, "Rising Significance of Fungus Infections in Man," and Dr. Albert M. Snell, the Mayo Foundation, "Tropical and Non-Tropical Sprue: Their Probable Interrelationship."

INTERNATIONAL SOCIETY OF SUGAR CANE TECHNOLOGISTS

THE sixth congress of the International Society of Sugar Cane Technologists will be held in Louisiana, with headquarters at the Louisiana State University, Baton Rouge, from October 24 to November 5.

This society includes in its membership technical men interested in the production and manufacture of cane sugar. There are at present more than 725 members. The society holds triennial meetings alternating between the western and eastern hemispheres.

The delegates will assemble and register at the Roosevelt Hotel in New Orleans on October 24. During the first week, the delegates coming from outside Continental United States will be the guests of the State of Louisiana, the Louisiana State University and the American Sugar Cane League, and will be taken on a tour of the sugar-producing area of Louisiana.

During the second week, from October 31 to November 5, the sessions for the presentation of technical papers and for discussions will be held at the Louisiana State University, Baton Rouge. More than 130 papers have already been received by the secretary. These will be presented at sectional meetings. There are sections for pathology, entomology, cultivation, field technique, soils and chemistry and mill operations.

Delegates will be present from most of the sugar-producing tropical and sub-tropical countries, including Java, India, Australia, South Africa, Egypt, Hawaii, British and French West Indies, Puerto Rico, Cuba, Hawaii, Mexico and others.

The congress is being directed by a committee, with J. G. Lee, Jr., dean of the College of Agriculture, Louisiana State University, as chairman. The officers for the sixth congress are: *General Chairman,* E. W. Brandes, U. S. Department of Agriculture, Washington, D. C.; *General Vice-chairman,* P. Honig, Experiment Station of the Java Sugar Industry, Pasoeroean, Java; *General Secretary-Treasurer,* C. W. Edgerton, Louisiana State University, Baton Rouge, Louisiana.

SCIENTIFIC NOTES AND NEWS

KING LEOPOLD of Belgium has appointed, according to *Nature,* the first thirty members of the Royal Flemish Academy of Belgium. The academy comprises three classes: Sciences, Letters (including Political and Moral Sciences) and Fine Arts. A decree creating a Flemish Academy of Medicine may be expected to follow soon. This will form a complete equivalent of the old Académie Royale de Belgique, the official language of which is French. Further members will be coopted, the total number being confined to twenty per class. The members in the sciences are: J. De Smedt, A. Dumon, W. Robyns and G. Verriest, all of the University of Louvain; J. Gillis, J. Meuwissen, A. Schoep, H. L. Vanderlinden and A. J. J. Vandevelde, all of the University of Ghent, and H. Schouteden, director of the Congo Museum.

A DINNER was given in honor of Dr. Virgil Snyder, professor of mathematics emeritus at Cornell University, and Mrs. Snyder on Friday evening, September 9, at the Hotel Woodstock, New York City. The number attending was thirty-six. A silver bowl was presented on which is engraved: "Presented to Professor Virgil Snyder, Cornell University, by his Ph.D.'s as a token of appreciation," and also the names of the thirty-nine

mathematicians who have written Ph.D. theses with Professor Snyder.

M. JEAN PERRIN, professor of physics in the University of Paris and a member of the council of the university, has been appointed by the French government president of the High Committee for Scientific Research. M. Perrin received the Nobel prize in physics in 1926.

DR. KARL VON AUWERS, professor of organic and physical chemistry at Marburg, celebrated his seventieth birthday on September 16.

DR. I. M. KOLTHOFF, professor of analytical chemistry and head of the department of chemistry at the University of Minnesota, on August 31 was made an officer of the Order of Oranje-Nassau by Queen Wilhelmina of Holland. This and other honors were bestowed by the Queen at her birthday celebration commemorating forty years as reigning monarch of the Dutch Empire.

THE King of Italy has conferred on Dr. J. C. Geiger, director of public health of the City and County of San Francisco, the Cross of Cavaliere of the Order of the Crown of Italy "for services of distinction in the field of public health."

DR. KARL WEGELIN, of Berne, Switzerland, who is a delegate to the International Pathological Congress in Washington, was guest of honor at a dinner of the Swiss Society of New York on September 20.

DRS. ERWIN JUNGHERR and Walter Landauer, of the Connecticut State College, have been awarded the Poultry Science Research Prize for 1938 of $100 for their paper entitled "A Condition Resembling Osteopetrosis (Marble Bone) in the Common Fowl," published in the *Bulletin* of the Agricultural Experiment Station.

THE honorary doctorate of laws will be conferred on Sir Walter Langdon Brown, emeritus professor of physics of the University of Cambridge, on the occasion of the centenary celebration of Dalhousie University, Halifax, Nova Scotia.

WILLIAM L. BATT, president of S. K. F. Industries, Inc., of Philadelphia, was elected president, to succeed Lord Leverhulme, of England, at the Washington meeting of the International Management Congress. He will preside at the meeting to be held in Stockholm in 1941. V. Lundvik, directing manager of the Swedish Industries, was elected deputy president of the international committee. The following vice-presidents were elected: L. H. Farasson, formerly president of the French committee for scientific management; Thomas R. Jones, president of American Type Founders Company, of Elizabeth, N. J.; Lord Leverhulme; Professor Th. Limperg, of the University of Amsterdam; Dr. F. Mauro, of Italy, first president of the committee, and George Seebauer, chairman of the German board of efficiency.

GEORGE E. ADAMS, associated with the Rhode Island College Experiment Station as student, horticulturist and in other capacities since 1891, dean of the College of Agriculture, director of extension and director of the station since 1933, retired on August 1. He is succeeded by Dr. Paul S. Burgess, dean of the College of Agriculture of the University of Arizona and director of the Experiment Station.

DR. H. S. WOLFE, who for the past six years has been horticulturist in charge of the Sub-Tropical Experiment Station of the University of Florida, has been appointed head of the department of horticulture in the college of agriculture of the university. Major W. L. Floyd has retired from this post after nearly thirty years of service.

DR. HIRAM S. LUKENS, who served as acting dean of the Towne Scientific School of the University of Pennsylvania after the death of Dr. Robert H. Fernald, was recently elected Blanchard professor of chemistry. He also is director of the department of chemistry and of the Harrison Laboratory of Chemistry.

DR. BERNARD J. ALPERS has been elected professor of neurology at Jefferson Medical College, Philadelphia, to succeed the late Dr. M. A. Burns. The appointment of Dr. Alpers, who has been connected with the University of Pennsylvania and the Pennsylvania Hospital, carries with it the establishment of a new laboratory of neurology at Jefferson Medical College. Dr. Henry K. Mohler has been appointed Sutherland M. Prevost professor of therapeutics, succeeding the late Dr. Ross V. Patterson, who also was his predecessor in the deanship.

DR. ROBERT SERBER, formerly research associate at the University of California at Berkeley, has been appointed assistant professor in the department of physics at the University of Illinois. Since the death of Dr. Kunz on July 18 Dr. P. Gerald Kruger has been acting head of the department.

DR. CLIFFORD WARREN CHAPMAN, of the Canada National Department of Health, has been appointed Emerson professor of pharmacology in the School of Pharmacy in the University of Maryland. He succeeds Dr. Marvin R. Thompson, who recently resigned to accept the directorship of the Warner Institute for Therapeutic Research.

DR. NORTON B. MOORE, of the Douglas Aircraft Company, has been appointed assistant professor of aerodynamics in the department of engineering of the University of California. Robert C. Uddenberg, of the

Boeing Aircraft Company at Seattle, has been made instructor.

DR. LESTER T. EARLS, of Centenary College, has been appointed assistant professor of physics at the Iowa State College.

DR. JOSEPH ALBERT LESAGE, professor of clinical medicine of the faculty of medicine of the University of Montreal, has been appointed dean of the faculty to succeed Dr. Télesphore Parizeau, who has retired. Dr. Georges H. Baril, professor of physiological chemistry, has been made director of studies.

DR. J. T. IRVING, head of the department of physiology of the Rowett Research Institute of Aberdeen, has been appointed university lecturer in physiology at the University of Cambridge.

DR. W. H. GEORGE, lecturer in physics at University College, Southampton, has been appointed head of the department of physics at Chelsea Polytechnic, in succession to Dr. L. Lownds, who is retiring after thirty-seven years' service.

JULIAN GLASSER has joined the staff of Battelle Memorial Institute at Columbus, Ohio, and is engaged in chemical and electrochemical research in the field of metallurgy. Dr. Glasser has had industrial experience as electrochemist with the Utah Radio Products Company and as physical chemist with the General Electric Company.

BERNARD RACKHAM has retired from the Victoria and Albert Museum, South Kensington, where for more than forty years he has been a member of the staff. He was associated with the department of ceramics, of which he has had charge since 1915, becoming keeper in 1921. He has been succeeded by W. B. Honey, who joined the staff of the department of ceramics in 1925.

DR. T. H. GOODSPEED, professor of botany at the University of California, is leading an expedition to the southern Andes to collect relatives of the tobacco plant and other forms. Dr. Goodspeed sailed from Naples on September 10, bound for Buenos Aires to take over the active direction of the expedition. In Buenos Aires he will meet two of his collectors, Walter J. Eyerdam, of Seattle, and Alan A. Beetle, of New Jersey. They will work southward from Buenos Aires through the Patagonian pampas to Tierra Del Fuego. After a stay there they will go through the Straits of Magellan and to the Chilean Lakes region, at which point they hope to arrive at the beginning of the collecting season. During his absence, Dr. Goodspeed, who is chairman of the University Committee on Cooperation with the Golden Gate Exposition, has been made a director of the exposition.

DR. Z. I. KERTESZ, research associate in chemistry at the New York State Agricultural Experiment Station at Geneva, has returned to the station following a year's leave of absence for special researches on enzymes at the Biochemical Institute in Stockholm under the auspices of the Rockefeller Foundation.

J. C. MILLER, geologist in the Conservation Branch of the U. S. Geological Survey, has left for New Mexico to investigate carbon dioxide occurrences in Harding, Mora and San Miguel counties in that state.

DR. ORA SMITH, professor of vegetable crops at Cornell University, who has had leave of absence and a fellowship from the university for study and travel in Europe, has recently returned from a seven months' tour of eighteen European countries, where he made a study of research in biology being carried out by various institutions.

DR. E. B. RENAUD, director; Ted Sowers and Cecelia Evans, field assistants; Carol Cos, secretary and graduate assistant, and seven students, members of the third Denver-New Mexico Expedition, have reached Denver after having made a survey of the Indian petroglyphs found in North Central New Mexico. The area explored extended from Taos in the north to Albuquerque in the south; west of the Rio Grande it spread from Ojo Caliente to Jamez Springs, along the Chama Valley and over the Pajarito Plateau, while east of the river it covered the Galisteo Basin and neighboring districts, south of Santa Fe. Some twenty prehistoric sites were visited and studied and nearly 1,000 sketches and many photographs of Indian petroglyphs were taken. The results will be studied and classified by Dr. Renaud.

THE autumn general meeting of the American Philosophical Society will be held on November 18 and 19, beginning at 10 A.M. on Friday, November 18. The society will provide hotel entertainment for non-resident members and invited guests if they will notify the executive officer as soon as possible of their intention to be present at the meeting. On Friday, November 18, the program will be under the auspices of the Population Association of America. A symposium on Population Problems will be presented, following which there will be a round table discussion; in the evening there will be a public lecture followed by a reception. A stated meeting of the council will be held on Friday afternoon at four o'clock, and on Saturday morning, November 19, there will be an executive session of the society. This will be followed by an open session at which recipients of grants from the Penrose Fund are invited to present reports of the progress or completion of their projects. Members of the society are invited to offer papers or to introduce non-members who have important papers to present.

DISCUSSION

LIGHT EYES AND GLARE SENSITIVITY

IT has been noted that light-eyed persons can see less well under low illumination than dark-eyed persons.[1] It is also well known that albinos who lack retinal pigment see poorly not only in the daytime but also at night. They are particularly sensitive to bright illumination. One investigator[2] has found that Negroes see from two to four times better than whites at night. These findings would indicate that persons with dark eyes (Negroes representing the extreme) see better at night, whereas light-eyed persons (albinos representing the extreme) are less sensitive in darkness.

Another investigator reports that dark-eyed persons withstand dazzling glare better than blonds.[3] Our own results from testing 1,238 individuals also indicate that light-eyed persons are more sensitive to glare than dark-eyed persons. This may be explained by the fact that light pigmented eyes, being more transparent than eyes with dark irises, transmit more light.

In this experiment an attempt was made to distinguish eyes on the basis of darkness of iris pigmentation. All the light-grey-, blue- and green-eyed subjects were placed in one group, and the dark-brown- and blue-eyed subjects were placed in another group. We feel that the important factor is not the color but the lightness or darkness of the eyes.

Six hundred and twenty light-eyed individuals and 618 dark-eyed individuals were used as subjects. The apparatus used in this investigation was a glare sensitivity test[4] which simulates in miniature a night-driving scene. While the subject holds his head against the eyepiece, two glaring lights shine into his eyes. The intensity of light at the eyepiece is kept constant at all times. The subject during the test is required to distinguish the direction of stripes painted on a rotating test object which has its own source of illumination. The threshold of sensitivity is determined by increasing the illumination on the test object until the subject can distinguish correctly the direction of the lines. At this point the index of glare sensitivity is ascertained in terms of the amount of light required to correctly perceive the lines. Fig. 1 shows that light-eyed individuals in all age groups are more sensitive to glare than dark-eyed individuals.

We have found that light-eyed persons are under a double handicap, at night: (1) Their eyes are not as sensitive under low illumination as those of dark-eyed individuals, so they are not able to distinguish dim objects when driving alone on a road at night; (2) they are more sensitive to glare than dark-eyed individuals, so that when confronted by glaring headlights they see the road less clearly.

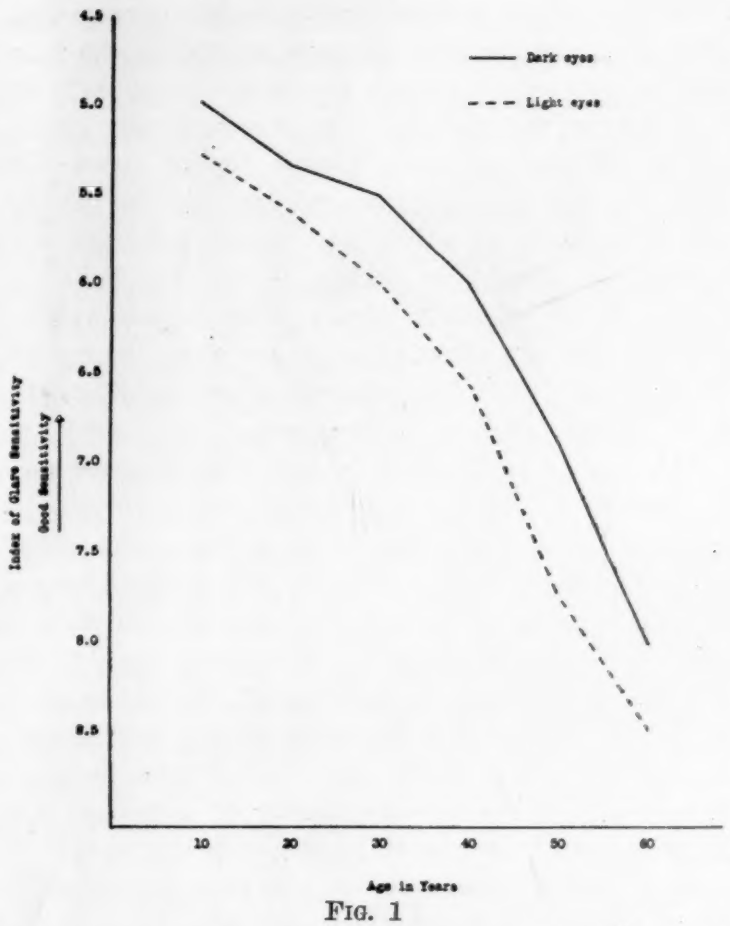

FIG. 1

There is also evidence that light-pigmented eyes have larger than average[5] pupils. Before acceptance, this discovery needs to be verified with more subjects. If found to be generally true, it may help to explain why light-eyed persons are blinded more by glaring headlights.

If future investigation corroborates the findings outlined above their applications to the automobile driver problem are as follows: (1) Light-eyed drivers as a group should be educated to drive more cautiously at night because of their poorer night vision and their greater susceptibility to glare from automobile headlights.

(2) Light-eyed drivers should be educated to protect their eyes by sun glasses in the daytime.

HARRY R. DESILVA
PHILLIP ROBINSON
HARVARD UNIVERSITY

ON THE CITATION OF AUTHORITIES FOR BOTANICAL NAMES

PEATTIE has recently made a plea for botanists to take up again the one-man citation for scientific names,

[1] H. Helson and J. P. Guilford, *Jour. Gen. Psychol.*, 9: 58–76, 1933.

[2] J. N. Roy, *Arch. Ophthal.*, 48: 72–83, 1919.

[3] E. Bayer, *Indust. Psychotechn.*, 10: 207–209, 1933.

[4] For description of glare test see: "Driver Testing Results," monograph by H. R. DeSilva, *Harvard Traffic Bureau*, 1937.

[5] H. S. Langfeld, *Ztsch. f. Sinnesphysiol.*, 42: 349–358, 1907–1908.

citing in the case of specific names the man who transferred the name into the proper genus, not the original authority. He also states that zoologists have picked the wrong man for their citations, since they cite *"the original authority, who first described the species."* It is urged that the one-man citation would make citing authorities less complex, thereby saving hours for those who use botanical nomenclature, but the important advantages of citing the original authority are mostly overlooked. In reality, Peattie has built an argument for scientific names with no authorities, which is entirely reasonable for popular, literary or horticultural usage, but botanists should not regulate their precise practices to these ends.

The original authority is the most important authority because it is: (1) The one which stands for a type and an original description. Some workers seem to fail to appreciate the importance of the type-concept in systematic botany. (2) The one with which our knowledge of the species begins. From the citation of an original authority, it is immediately possible to gage the length of time that the organism has been known to science. (3) The one which best affords us some opportunity to estimate the validity of a species. By the citation of the original authority, a conservative worker's species, transferred to a small segregate genus by a "splitter," still remains recognizable, while in the one-man citation, as proposed by Peattie, the original authority is obscured.

That the double citation has great practical advantage is evidenced by an actual experience which I had on the morning when the copy of SCIENCE, with Peattie's article, arrived. I am soon to visit an herbarium in South Carolina and desire to know what types of an early author, representing species, recognized to-day, in certain families in which I am interested, may be expected to be found there. Reference to Small's "Manual of the Southeastern Flora," recognizing many segregate genera, but fortunately employing the double citation, revealed in 15 minutes all the information that I wanted to know. Had this manual followed Peattie's proposal, it would have been necessary to indulge in endless library investigation, looking up references by people who had transferred names, trying to determine from the old author's descriptions to what modern genera his species would have been transferred and then whether or not they are to-day valid. The slight inconvenience to the man who wrote this manual thus saved me hours of thankless drudgery, simply because he employed the double citation. It might be suggested that I could have obtained my information by reference to the writings of the original authority himself, but from them I would have no way of knowing which are recognized to-day, nor could I readily have obtained this information from Index Kewensis.

Let popular writers discard all authorities, but let systematists continue to follow their slowly evolved, meticulous practice. Authorities are not part of a name, but for accurate systematic work their careful citation becomes an absolute necessity.

ROBERT T. CLAUSEN
CORNELL UNIVERSITY

BACTERIAL-PLANT GROUP OF DHAINCHA

THE names of the genus "Sesban," "Sesbana," "Sesbania," are synonymous.[1] The plant worked by me and published elsewhere,[2] *viz., Sesbania aculeata* Poir, commonly called in India "Dhaincha," and the two species mentioned by Briscoe and Andrews,[3] *viz., Sesban emerus* Aubl and *Sesban exaltata* (Raf.) Rydb., belong to the same genus "Sesbania."[4,5]

Briscoe and Andrews (*loc. cit.*) confirm the writer's earlier and more elaborate observations, save a few minor points. The writer, therefore, claims priority in its nomenclature as "Dhaincha Bacterial-plant Group" instead of that tentatively proposed by Briscoe and Andrews as "Sesban Inoculation Group."

Further work conducted by the writer on three other species of Sesbania, *S. speciosa,* Taub ex Ebgl.,[6] *S. grandiflora,* Poir,[1] and *S. macrocarpa,* Mohl ex Rafin,[1] indicate that they all belong to the "Dhaincha bacterial-plant group."

M. S. RAJU
AGRICULTURAL RESEARCH INSTITUTE,
COIMBATORE, INDIA

SCIENTIFIC BOOKS

A BIOGRAPHY OF CLAUDE BERNARD

Claude Bernard, Physiologist. By J. M. D. OLMSTED, Professor of Physiology, University of California. Foreword by ALEXIS CARREL. Harper and Brothers, New York and London, 1938. xvi + 272 pp. $4.00.

CLAUDE BERNARD died on February 10, 1878. A few days later Michael Foster, then Trinity praelector in physiology at Cambridge, met his senior class and, putting his prepared lecture aside, remarked: "The recent death of a great physiologist, Claude Bernard,

[1] J. D. Hooker and B. D. Jackson, "Index Kewensis Plantarum Phanerogamarum," Tomme II, p. 890, 1885.
[2] M. S. Raju, *Zentralblatt für Bakt.*, etc., II Abt., 94: 249–262, 1936.
[3] C. E. Briscoe and W. B. Andrews, *Jour. Am. Soc. Agron.*, 30: 135–138, 1938.
[4] A. W. Hill, "Index Kewensis Plantarum Phanerogamarum," Supl. VI, pp. 193, 1916–1920.
[5] A. W. Hill, *Ibid.*, Supl. VII, pp. 223, 1921–1925.
[6] T. Duarand and B. D. Jackson, *Ibid.*, Supl. 1, pp. 385, 1886–1895.

has determined me to spend the whole of to-day's lecture in pointing out to how large an extent the modern doctrines of physiology have been influenced by his brilliant investigations. It is not my purpose to dwell upon his personal history; indeed, there is happily but little to tell. Men of science are fortunate when their personal histories are uneventful; they live in their work and not in their lives." Foster's senior class then heard a masterful résumé of the scientific contributions of the great French physiologist. The Trinity praelector had evidently prepared his lecture with characteristic thoroughness, for he was prevailed upon to publish it a few weeks later in the *British Medical Journal* for April 13 and 20, 1878 (pp. 519–521; 559–560). As is well known, Foster published later (1899) an attractive "Life" of Bernard in "The Masters of Medicine Series." Neither of Foster's accounts, however, were biographies in the strict sense of the word; rather were they logs of his career as a scientist. Foster was interested in the background and development of his scientific ideas and his discoveries, but he made little attempt to portray Bernard as a man.

Professor Olmsted's "Biography," on the other hand, is far better rounded out, and is all that a biography should be; indeed it at once takes its place with the great personal biographies of our literature: Masson's "Milton," Festing Jones's "Samuel Butler," Paget's "Paré," Morley's "Cardan" and "Palissy," and with Cushing's "Osler." Olmsted's text is most attractively written and exhaustively documented, and the fifteen years he has spent collecting, sifting and digesting his sources are evident in every page of the book. The conscientious documentation affords one an opportunity to verify nearly every statement in the text, yet Dr. Olmsted has handled his citations so skilfully that they seldom catch the eye on the text page and one can read the book, as perhaps it should be read, as a novel. Certainly no medical student or teacher of physiology could arise from an hour's perusal of this fascinating record without being thrilled and inspired.

After the Foreword (which unfortunately repeats some of the half-truths about Bernard which Dr. Olmsted has tried to correct in his text), the book begins with a full account of Bernard's life (eight chapters). The details here given are drawn almost entirely from hitherto unpublished source material, and the account as a whole serves to correct the misimpression created by Foster that there was little of interest to tell about Bernard's personal history. The chapter begins appropriately with an authentic account of his birth and of the oft-repeated anecdote about his first literary production, the tragedy "Arthur de Bretagne," which, when presented to the Parisian critic Saint-Marc Girardin, was returned with the firm comment, "You have done some pharmacy, study medicine. You have not the temperament of a dramatist." Bernard forthwith matriculated at the School of Medicine in Paris. The rest of the story is well known to all physiologists. It was in the autumn of 1834 at the age of twenty-one that he entered the medical school. Save for anatomy, in which he excelled, he was not a good student; he devoted much of his spare time to anatomical dissection and while an interne at Hôtel Dieu his skill as a dissector became known to François Magendie, the founder of the French school of physiology. In 1843 Bernard became his *préparateur* at the Collège de France, which marked the beginning of Bernard's career as an experimental physiologist. He began by studying the effects of nerve section, spinal accessory, facial and vagus; his first published paper, which appeared in May, 1843, had to do with the chorda tympani—be it noted that this did not appear until he was thirty years of age. In the same year he undertook a new line of investigation and issued as a thesis for his medical degree a justly celebrated contribution entitled, "Du Suc gastrique et de son Rôle dans la Nutrition," which was the beginning of all that followed.

The second part of Professor Olmsted's biography is concerned with Bernard's contributions to the science of physiology. His early papers are described at some length and then came the themes so intimately associated with his name: pancreatic digestion, the glycogenic function of the liver, the vasomotor nerves, curare and other poisons, his collaboration with Pasteur, general physiology and, finally, his posthumously published notes on fermentation. The third part of Olmsted's biography is taken up with Bernard's speculative contributions, his tendencies as an eclectic and agnostic, his adherence to the principles of scientific determinism, and, finally, the broad concept of the stability of the internal environment of the body touched upon in many of his early works, but published in his two volumes, "Leçons sur les Phénomènes de la Vie," issued in 1878, the year of his death.

Bernard left his mark upon all phases of modern physiology, and no student of the subject can readily understand modern physiological thought without careful study of his writings. This illuminating biography also does much to elucidate the growth of physiology in the nineteenth century. It places Bernard's contributions in their proper perspective, and it paints a faithful portrait of Bernard as a human being—including his domestic misfortunes and his fascinating correspondence with Madame Raffalovich. The book has the external appearance of one of the lesser modern novels, but despite this lapse in taste on the part of the publisher, the book is equipped with

an excellent biography and a general index, satisfactory for authors, but quite inadequate for subjects. It is understood that Professor Olmsted now intends to write a life of Magendie, and it is scarcely necessary to say that physiologists on both sides of the Atlantic will await his second biography with a sense of high anticipation.

J. F. FULTON

LABORATORY OF PHYSIOLOGY,
YALE UNIVERSITY SCHOOL OF MEDICINE

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SYMPOSIUM ON MENTAL HEALTH

PRELIMINARY ANNOUNCEMENT

THE Section on Medical Sciences of the American Association for the Advancement of Science announces a Symposium on Mental Health to be held in conjunction with the annual meeting of the association at Richmond, Va., from December 28 to 30, 1938, and cordially invites the attendance and participation of all interested persons.

A COOPERATIVE PROJECT

Collaborating in the plans for the event are the American Psychiatric Association (an affiliated body of the A. A. A. S.), the U. S. Public Health Service, the Mental Hospital Survey Committee (composed of representatives of eight national medical bodies),[1] the National Committee for Mental Hygiene and a special committee[2] of eminent psychiatrists who are developing the program for the symposium under the chairmanship of Dr. Walter L. Treadway, formerly assistant surgeon general of the Public Health Service.

PURPOSE OF THE SYMPOSIUM

The symposium will provide an unusual opportunity to bring the great problem of mental health before the forum of the A. A. A. S. and, through it, to the scientific and lay public of America. It will be the tenth in the series of symposia held by the Section on Medical Sciences since 1934 and the first to deal with this important subject. All who have a serious interest in the subject will be welcome—scientists and laymen, professional workers and others—for the mental hygiene movement is a *public movement,* including among its adherents representatives from all walks of life and courting the good-will and support of all in its far-reaching aims and activities.

Its object will be, essentially, to present a synthesis of existing knowledge of the mental health problem, to evaluate past experience, crystallize aims and objectives and to marshall the scientific forces of the nation for a concerted, coordinated and more effective attack on mental disorders and disease. By drawing on the various scientific disciplines, within and without the field of mental hygiene, that are in a position to contribute new knowledge, we hope to light up the problem as never before and to arrive at a new and better orientation in dealing with it on its practical as well as theoretic side.

PLAN AND METHOD

The Symposium on Mental Health will be a three-day affair, with six sectional sessions, running consecutively, and with upwards of seventy scientific contributions. In addition, mental hygiene will be the topic of discussion at the final general session of the association's meeting, at which the symposium proceedings will be summarized. Headquarters for the symposium will be established at the Jefferson Hotel in Richmond, at which the administrative business of the symposium will be conducted during the conference period.[3] The special sessions of the symposium will be held in the auditorium of the Commonwealth Club; the general session at the Mosque.

The symposium will be, in some respects, a unique affair, in that most of the contributions will not be read at the meeting but will be published in advance, in a series of six brochures, one for each session, which will be used as a basis for discussion at the meeting. The various sessions of the symposium will be arranged and conducted under the leadership of section chairmen, who will summarize and critically analyze the

[1] American Medical Association, American Psychiatric Association, American Neurological Association, American Board of Psychiatry and Neurology, U. S. Public Health Service, National Committee for Mental Hygiene, Canadian Medical Association and National Committee for Mental Hygiene of Canada.

[2] Members of the committee, besides Dr. Treadway, are Dr. Clarence M. Hincks, general director, National Committee for Mental Hygiene, New York; Dr. Franklin G. Ebaugh, professor of psychiatry, University of Colorado, Denver; Dr. Roscoe Hall, clinical director, St. Elizabeth's Hospital, Washington, D. C.; Dr. Samuel W. Hamilton, director, Mental Hospital Survey Committee, New York; Dr. Grover Kempf, senior surgeon, Public Health Service, New York; Dr. Nolan D. C. Lewis, director, New York State Psychiatric Institute, New York; Dr. Abraham Myerson, director of research, Boston State Hospital; Dr. James S. Plant, director, Essex County Juvenile Clinic, Newark, N. J.; Dr. Harry Stack Sullivan, president, William Alanson White Psychiatric Foundation, New York; Dr. Joseph Zubin, assistant psychologist, Public Health Service, New York, and Dr. Malcolm H. Soule, director, Hygienic Laboratory, University of Michigan, Ann Arbor.

[3] Until then, correspondence in relation to the symposium should be addressed to the Administrative Office, Symposium on Mental Health, A. A. A. S., Room 822, 50 West 50th Street., New York City, Paul O. Komora, Administrative Secretary.

individual contributions, which will then be formally and informally discussed by persons to be selected by them and to whom the brochures will have been sent for study well in advance of the meeting. In addition, there will be opportunity for general, open discussion at each session. All the discussions and summaries will be included, with the advance papers, in the published proceedings of the symposium, which will be issued and sold by the A. A. A. S. after the meeting.

This plan of advance publication of a majority of the papers will make for the most effective use of the symposium technique, by providing the fullest time for free discussion and debate during the conference period. It will also insure a coordinated and integrated arrangement of the material to be presented, in that the various papers will be carefully edited, before use, to assure continuity, proportion and unity of thematic treatment. This procedure, by controlling the selection of topics and the areas to be covered, will tend to focus the discussions on basic issues and considerations of primary importance.

Program Development

With this in view, the committee is constructing a special kind of program, having in mind the practical usefulness of the material in furthering the immediate and long-range objectives of the symposium, as well as its general scientific value. The program will thus be geared to the special purpose of the symposium, in which the whole field of mental hygiene will be staked out and the individual contributions fitted into a definite scheme and framework of discussion. It will present a wide range of data, covering all phases of mental health, but kept down, as far as possible, to fundamentals. The contributions will aim, on the one hand, to bring out what is definitely known in regard to a particular problem, and on the other, to expose for discussion and study questions and issues that are in the forefront of present-day scientific thinking in psychiatry and mental hygiene.

In formulating the program, the committee has adopted what it calls a "functional approach," in which the phenomena of mental disease and disorder are visualized, in the first place, as *intra-personal conditions*, that is, problems that arise within the individual; and, in the second place, as *inter-personal conditions*, in which environmental and social pressures are recognized as contributing factors in the production of mental and emotional stresses.

In the first category consideration will be given to well-known mental-disease entities of the functional and organic variety, such as schizophrenia, the manic-depressive psychoses, epilepsy, those associated with structural changes in the nervous system, with alcoholism, syphilis and other endogenous and exogenous factors. In the second category attention will be centered on the geographical, physical and cultural environments conducive to mental health or ill-health, in which training and education, social and economic influences play significant rôles.

Half of the program will deal with problems of a medical nature that are the primary concern of the psychiatrist, neurologist, physiologist, biologist, biochemist and public health specialist; half will cut across non-medical fields and take in the sociologist, psychologist, anthropologist, economist, educator and political scientist. The latter will stress issues coming under the broad heading of "positive" mental hygiene and looking to the conservation and promotion of mental health.

Time Table of the Symposium

In line with this conception of program structure and function, the committee has made a careful canvass of the field, selecting contributors who will present the most authoritative and pertinent communications on the subject-matter to be covered by the various sessions. The topical material will be developed in sequence, one section leading logically to another, with an even flow of movement throughout the total symposium. The sectional headings and schedule of sessions are provisionally as follows:

Session I, Wednesday morning, December 28

Orientation and Methods in Psychiatric Research: Dr. Nolan D. C. Lewis, session chairman.

Introductory Address on Aims and Scope of Symposium: Dr. T. M. Rivers.

Session II, Wednesday afternoon, December 28

Sources of Mental Disorder and Disease, Their Amelioration and Prevention: Dr. Abraham Myerson, session chairman.

Session III, Thursday morning, December 29

The Economic Aspects of Mental Health: Dr. Joseph Zubin, session chairman.

Session IV, Thursday afternoon, December 29

Physical and Cultural Environment in Relation to the Conservation of Mental Health: Dr. Harry Stack Sullivan, session chairman.

Session V, Friday morning, December 30

Mental Health Administration: Dr. Clarence M. Hincks, session chairman.

Session VI, Friday afternoon, December 30

Professional and Technical Education in Relation to Mental Health: Dr. Franklin G. Ebaugh, session chairman.

General Session, Friday evening, December 30

Summary and Address: Dr. C. Macfie Campbell.

SCOPE OF SCIENTIFIC CONTRIBUTIONS: A PRE-VIEW

The first day will be devoted to a critical survey of concrete scientific problems in the domains of psychiatry, psychopathology and contributory fields, the sources and ramifications of mental disease and disorder, methods of investigation, diagnosis and treatment, and measures for the amelioration and prevention of mental disorders. The discussions will deal with the genetic and biological bases of mental disorders on the one hand, and the maladjustments between environment and biological functioning on the other. The philosophy of psychiatric research, the relationship of fundamental to applied research, the present status of psychiatric investigation and the rôle of academic and tax-supported research will be evaluated and discussed.

The second day will see the statisticians, economists and social scientists appraising the magnitude and scope of the mental health problem, its financial and human costs, the manifold social problems associated with mental disease, and its broad community and social aspects, in terms of environmental causes and conditions, their modification and control. The discussions will show, on the one hand, the enormous loss due to mental disease, in terms of curtailed earning power and of public taxation for institutional maintenance, and on the other, how economic factors contribute to mental breakdowns through maladjustments in the industrial and social order. They will assess the complex influences of modern civilization on human adjustment in terms of technological advancement, social lag, political and governmental factors, education and other social and cultural forces.

The third day will be focused on the practical aspects of the management and control of mental disease and disorders, public policy in the care and treatment of the mentally ill, the organization of mental health services and related matters. The discussions will concern themselves with the problem of developing more adequate measures and a wider and more equal distribution of facilities for the early recognition and treatment of mental ill-health, and the promotion of better public administration and of ways and means to implement mental health programs. Particular attention will be given to the pressing need for trained workers in the mental-hygiene field and the problem of developing a technical personnel adequate to the need.

MOTIVATION AND AIMS

The Symposium on Mental Health should be one of the most interesting and, if we consider the extent and character of the mental health problem, one of the most important conferences ever sponsored by the Section on Medical Sciences. It will be the first time in the history of the A. A. A. S. that this subject will have received special attention as a major topic on the agenda of its meetings. Mental diseases are among the most challenging of all medical problems, the most disabling and, in their personal, social and economic consequences, the most serious in the whole category of diseases. They occupy more hospital beds in this country than all others combined, yet they have been comparatively neglected, until relatively recently, so far as the general medical profession and the medical sciences are concerned. With the rapid advance of psychiatry and mental hygiene during the past few years, however, with their impressive achievements in research, therapy and prevention, mental disorders are receiving increasing recognition as a major problem of medicine worthy of serious attention and study by every medical discipline and offering great scientific promise.

Mindful as they are of its scientific value, those who are organizing the symposium rightly regard it, nevertheless, as something more than an opportunity for discussion and study. They look upon it as a stepping stone to practical accomplishment, as a vehicle for the larger objective, which is to secure fruitful, nation-wide action toward the solution of the mental-disease problem in its immediate and remoter aspects. A glance at the present status of mental health administration in the United States will show that no community, no state or local jurisdiction has kept pace with the needs of the mentally ill. Rapid growths of population, coupled with the necessity for securing institutional provisions for the more urgent cases, have resulted in the development of piecemeal facilities and policies, without regard to an adequate and balanced program to meet these needs.

It is hoped that one result of the symposium will be an authoritative and comprehensive formulation of fundamental principles that may serve as a practical guide to state and local governments in developing sound, progressive and more uniform policies and measures in the care and treatment of the mentally ill.

It is hoped, further, that from the symposium will come a fresh approach and new points of view that may with advantage be brought to bear upon the whole problem of the cure, control and prevention of mental and nervous disorders. Dr. Treadway strikes the keynote of the symposium in the following epitome of its aims and purpose:

> It is high time that we mobilized all our scientific resources and explored all promising approaches, in order to realize the potential contributions inherent in the various scientific disciplines, within and without the field of psychiatry. The Symposium, we feel, will illuminate the mental health problem as never before and will lead

to a new and better orientation in dealing with mental diseases and disorders, both as to treatment and prevention, in their personal and more general aspects. Out of this undertaking, we hope, will come a publication of the highest scientific and practical value, one that will provide a secure base for future operations against this scourge of mankind, and will influence the development of mental hygiene for years to come.

MALCOLM H. SOULE,
Secretary, Section on Medical Sciences, American Association for the Advancement of Science

SPECIAL ARTICLES

RECOVERY OF EASTERN EQUINE ENCEPHALOMYELITIS VIRUS FROM BRAIN TISSUE OF HUMAN CASES OF ENCEPHALITIS IN MASSACHUSETTS

DURING late August and early September, 1938, there occurred an unprecedented outbreak of Eastern equine encephalomyelitis in southwestern Massachusetts. This was accompanied by cases of fatal encephalitis in children nearby. Fothergill, Dingle, Farber and Connerley[1] have just reported the isolation of Eastern equine virus from one of these fatal human cases, and our report confirms their results and describes positive findings in four additional cases.

Brain tissue from seven cases has been sent to us for study by Drs. Pope and Feemster, of the Massachusetts State Department of Health. Five of them yielded the Eastern equine virus as follows.

Brain tissue from each case received in sterile glycerine was triturated in a mortar and diluted in hormone broth to make a 10 per cent. suspension. 0.03 cc of the supernatant was injected intracerebrally into 3-weeks-old Swiss mice.

Forty-eight hours later most of the mice from four cases showed ruffled fur, slowing of activity, alternating with convulsive twitchings. They rapidly became prostrate with occasional accompanying convulsions and succumbed in 48 to 72 hours. Cultures from brain and organs proved sterile. Certain prostrate mice were sacrificed and their brains removed, prepared as above, and injected intracerebrally into further mice.

The mice receiving the second passage material became ill in 48 hours and died or were sacrificed within 72 hours. Further passages have given similar results.

Third and fourth passage brain suspensions were filtered through a Seitz pad and injected intracerebrally into mice. The animals succumbed promptly after 2 to 3 days, indicating that the transmissible agent was a virus of relatively small dimensions.

Similar material was titred intracerebrally in 30-day-old mice and subcutaneously and intraperitoneally in 12- to 16-day-old mice. All mice died through the 10^{-8} dilution. The high virulence of the agent in young mice by the subcutaneous and intraperitoneal routes is characteristic of the Eastern equine encephalomyelitis virus.[2] Moreover, the extremely short incubation period of 48 hours is likewise suggestive of the equine virus.

The virus was highly infectious for mice by the nasal route. Third passage mouse brain virus was fatal to monkeys and guinea pigs when injected intracerebrally in large doses. Temperatures rose to 105°

TABLE I

DIFFERENTIAL VIRULENCE (INTRACEREBRAL) IN LABORATORY ANIMALS OF VIRUSES ASSOCIATED WITH PRIMARY ENCEPHALOMYELITIS IN MAN

Virus	Rabbit	Guinea pig	Mouse	*M. rhesus* monkey	Young sheep
Rabies	++	++	++	++	++
Eastern equine encephalomyelitis	±	++	++*	++	++
Louping-ill	0	0	++	++	++
Japanese B encephalitis	0	0	++	++	++
St. Louis encephalitis	0	0	++	0–±	0
Poliomyelitis	0	0	0	+	0

* Virulent peripherally in high dilution for 16-day-old mice.

[1] L. D. Fothergill, J. H. Dingle, S. Farber and M. L. Connerley, *New England Jour. Med.*, September 22, 1938.

[2] A. B. Sabin and P. K. Olitsky, *Proc. Soc. Exp. Biol. and Med.*, 38: 595, 1938.

TABLE II

NEUTRALIZATION OF MASSACHUSETTS VIRUS IN EASTERN EQUINE ENCEPHALOMYELITIS IMMUNE SERUM

Serum rabbit	Age of mouse and route of injection of serum-virus mixtures	Fate of mice injected with mixtures containing virus diluted as follows							No. M.L.D. protection
		10^{-2}	10^{-3}	10^{-4}	10^{-5}	10^{-6}	10^{-7}	10^{-8}	
Normal	4 weeks, intracerebral	....	2*,3,3,3,	2,2,3,4	2,3,4,4	3,3,4,4	3,3,3,4	3,4,S,S	
Immune	" " "	....	5,5,6,6	5,5,7,8	6,7,8,S	7,S,S,S	S,S,S,S	S,S,S,S	10^3
Normal	2 " intraperitoneal	2,2,3	2,3,3,	2,3,3	3,3,3	3,4,S	3,3,3	3,4,S	
Immune	" " "	S,S,S,	S,S,S,	S,S,S,	S,S,S,	S,S,S,	S,S,S,	S,S,S,	10^{6+}

* Day of death following injection.
S = Remained well.

at 24 hours and dropped to 104° or less after 48 hours. At 48 hours the animals appeared dazed, showed muscle weakness and then became prostrate, succumbing in 72 to 96 hours. Blood and spinal fluid taken at 48 hours contained virus. Brains from the animals removed just before or after death were free of bacteria and positive for virus. Rabbits similarly injected with the massive dose succumbed within 72 hours and their brain tissue injected intracerebrally into mice yielded virus after an irregular incubation period. Guinea pigs given virus in the pad developed a fatal encephalitis after 5 days. These reactions in animal species are different from those of other known viruses causing central nervous system virus infection in man and are characteristic of the equine strain (Table I).

Finally, specific neutralization tests were run on the four strains with hyperimmune equine encephalomyelitis rabbit sera kindly furnished by Dr. P. K. Olitsky. 0.3 cc of each brain emulsion dilution of virus was mixed with an equal quantity of undiluted immune serum and similarly with undiluted normal rabbit serum. The mixtures were shaken and then injected without delay intracerebrally into Swiss mice according to the standard technique, and in duplicate intraperitoneally into 16-day-old mice according to Dr. Olitsky's technique.[3] The immune sera showed a protective effect in the intracerebrally injected mice of at least 10^3 lethal doses and in the young mice of 10^6+ lethal doses (Table II), thus completing the identification of the unknown virus strains as Eastern equine encephalomyelitis. Western equine encephalomyelitis immune serum did not neutralize the virus.

This is the first instance in which the horse virus has been definitely implicated as causing encephalitis in man.

LESLIE T. WEBSTER
F. HOWELL WRIGHT
THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, NEW YORK, N. Y.

THE PRODUCTION OF A GONADOTROPHIC SUBSTANCE (PROLAN) BY PLACENTAL CELLS IN TISSUE CULTURE

IT has been generally accepted that the placenta produces the anterior pituitary-like hormone (prolan) excreted in the urine during pregnancy. The weight of evidence supports such a theory, but there has been no direct proof. It seemed that the culture of placental cells *in vitro* might provide a method of demonstration. With this in view continuous culture of human placental tissue was undertaken.[1]

In the present investigations the specimens cultured were a placenta of three months, obtained by hysterotomy, and a hydatidiform mole. The mole specimen was sent us from the Boston Lying-In Hospital through the courtesy of Dr. Arthur Hertig. At the time of the first assays the placental tissue had been in culture for two months and the mole for nine days. The culture medium used was human cord serum 40 per cent., beef embryo extract 10 per cent., balanced salt solution 10 per cent., and chicken plasma 40 per cent. For microscopic observations some fragments were explanted into large lying drop preparations on No. 1 cover slips (40×45 mm). Most of the tissue fragments were explanted in the same medium in roller tubes. The roller tubes with added supernatant fluid were rotated at a constant speed of twelve revolutions per hour by the Gey[2] method. The supernatant fluid was changed every three and four days, and the cultures were patched and transferred as necessary.

In the mole cultures three morphologically different types of cells migrated from the explants: (1) large epithelial cells with clear cytoplasm and round delicate nucleus with several nucleoli. Some of the large cells showed as many as four nuclei and by their general appearance were considered as possibly the precursors of the syncytium. (2) Fairly large and densely granular cells. These occurred usually in closely packed masses with the single migrating cells in the medium showing many short processes and giving to them an asteroid or chestnut burr appearance. These cells had small delicate round nuclei. (3) Large spindle cells, usually vacuolated, with prominent slightly oval nuclei and with a single large nucleolus. These cells showed evidence of mitotic and of amitotic division.

The placental cultures showed chiefly the large vacuolated spindle cells, but with some transitional types to ones of epithelioid appearance. In these cultures the syncytium exhibited no growth. The myxomatous connective tissue grew very poorly and was soon outstripped by the growth of Langhans' cells. After about two weeks of cultivation in the roller tubes only cells of the Langhans' type were found. A cytological description of the cells and their cultural characteristics will appear in a later publication.

The production of prolan by the placental cells was tested by performing an Aschheim-Zondek test on 21-day-old rats with the cell free supernatant fluid which was removed after having been in contact with the living cultures for three days.

---

[3] P. K. Olitsky and C. G. Harford, *Jour. Exp. Med.*, 68: 173, 1938.

[1] According to published reports placental tissue has been cultured by Heim, Neuweiler and Guggisberg, Friedheim, Sengupta and Taszkan but was not maintained longer than three weeks. In unpublished work done about the same time (G.O.G.—1927) hydatidiform mole was cultured for a period of sixteen days and human placenta for ninety-four days.

[2] G. O. Gey, *Am. Jour. Cancer*, 17: 752, 1933; G. O. Gey and Margaret K. Gey, *Am. Jour. Cancer*, 27: No. 1, May, 1936.

The first assay was performed on the combined fluid from the tissue cultures of the three-month placenta and the hydatidiform mole. There were five tubes of placental tissue containing approximately twenty fragments each and four tubes of hydatidiform mole containing about ten fragments each. The total amount of fluid injected was 4 ml; 0.6 ml was injected twice daily for three days. The rats were opened and the ovaries examined on the fifth day. The test was strongly positive for prolan, each ovary having several blood points. One ovary was fixed and examined microscopically in each assay. As controls 4 ml of human cord serum and 8 ml of beef embryo extract were injected separately into two rats. These substances were the main constituents of the nutritive medium used in the cultivation of the tissue. Both gave negative assays.

The following week, using the same technique, fluid was removed from the tissue cultures of both the three-month placenta and the hydatidiform mole and tested separately for prolan. 1.75 ml of fluid from the placental cultures proved positive for prolan. The fluid from the mole gave a positive Friedman test. As a control 1.75 ml of fluid removed from roller tube cultures of normal human muscle fibroblasts which had been growing in continuous culture for 20 months was used. This gave a negative reaction.

The next series of assays, using 1.5 ml of supernatant fluid from the three-month placenta, 1.25 ml of fluid from mole and 1.75 ml from normal human muscle fibroblasts were all negative for prolan. The fluid from the mole, however, produced several large follicles in each ovary and a swelling of the uterus. Microscopic examination of the ovaries showed an increase in the size of the interstitial cells. This series of assays was performed irregularly, two of the injections being given only three hours apart instead of the desired eight hours and the rats used, although chronologically 21 days old, were noted to be smaller than usual.

The assays were repeated at a later date, using 4 ml of fluid from the mole cultures, 2 ml from the placental cultures and 3.5 ml of fresh unincubated culture fluid as a control. The culture techniques had been slightly changed before this fluid was removed, and the fragments were not very active. The hydatidiform mole fluid again proved positive for prolan. The placenta and the control gave negative prolan reactions.

1.5 ml of fluid from a culture of cells of the anterior pituitary gland of an eight-month human foetus was also assayed for prolan. The ovaries of the test rat showed no blood points grossly. Microscopically some increase in the size of the interstitial cells and an apparent increase in the amount of interstitial tissue was noted. Although this could not be interpreted as a positive assay for prolan it suggested some hormonal activity.

In summary: (1) evidence is presented which shows that the placental cells produce a substance similar to the prolan-like substance found in the urine of pregnant women. (2) Placental cells growing in tissue culture for a period of over two months retain the ability to produce the hormone *in vitro*. (3) The cells responsible for this hormonal activity are possibly the Langhans' cells. (4) A hydatidiform mole growing in tissue culture for one month also produced the hormone. (5) The supernatant fluid bathing cultures of anterior pituitary cells of a human foetus gave negative prolan assays, but the microscopic appearance of the ovaries in the test rat suggested some hormonal activity. (6) We desire to extend these observations to additional material, and inasmuch as mole and chorionepithelioma are of rare occurrence we would greatly appreciate the help of others in supplying us with fresh, sterile specimens of these tumors.

GEORGE O. GEY
G. EMORY SEEGAR
LOUIS M. HELLMAN
JOHNS HOPKINS HOSPITAL AND UNIVERSITY
AND
CARNEGIE EMBRYOLOGICAL LABORATORY

THE COLD WATER LAYER OF THE SCOTIAN SHELF

PROBABLY the most important feature of the waters of the continental shelf, to the south of Nova Scotia, is the cold water layer of a temperature less than 5.0° C.—as low or lower than 0.0° C. This layer is found in summer at depths between 17 and 66 fathoms offshore, and between 33 and 80 fathoms inshore.[1] Considering the salinity of the waters of such temperatures, on the Scotian shelf, they may be classified as "bank" or "slope" water.[2] There have been two opposing views as to the origin of this water, one of which favors "winter chilling in situ" while the other favors "water movements from the east." A cooperative effort between the Fisheries Research Board of Canada and the Woods Hole Oceanographic Institution, during the winter of 1936, furnished the first extensive body of data for the assessment of the relative importance of these two points of view.[3]

The temperature and salinity data from a February section, extending outwards from Halifax to beyond the edge of the continental shelf, furnish the T-S diagram of Fig. 1. The volume transports in the

[1] H. B. Hachey, *Trans. Amer. Fish.*, 66: 237–241, 1937.
[2] Paul Bjerkan, Can. Fish. Exped. 1914–15, Department Naval Service, Ottawa, 1919.
[3] The writer is indebted to Mr. C. O'D. Iselin, of the Woods Hole Oceanographic Institution, who agreed to the interchange of data.

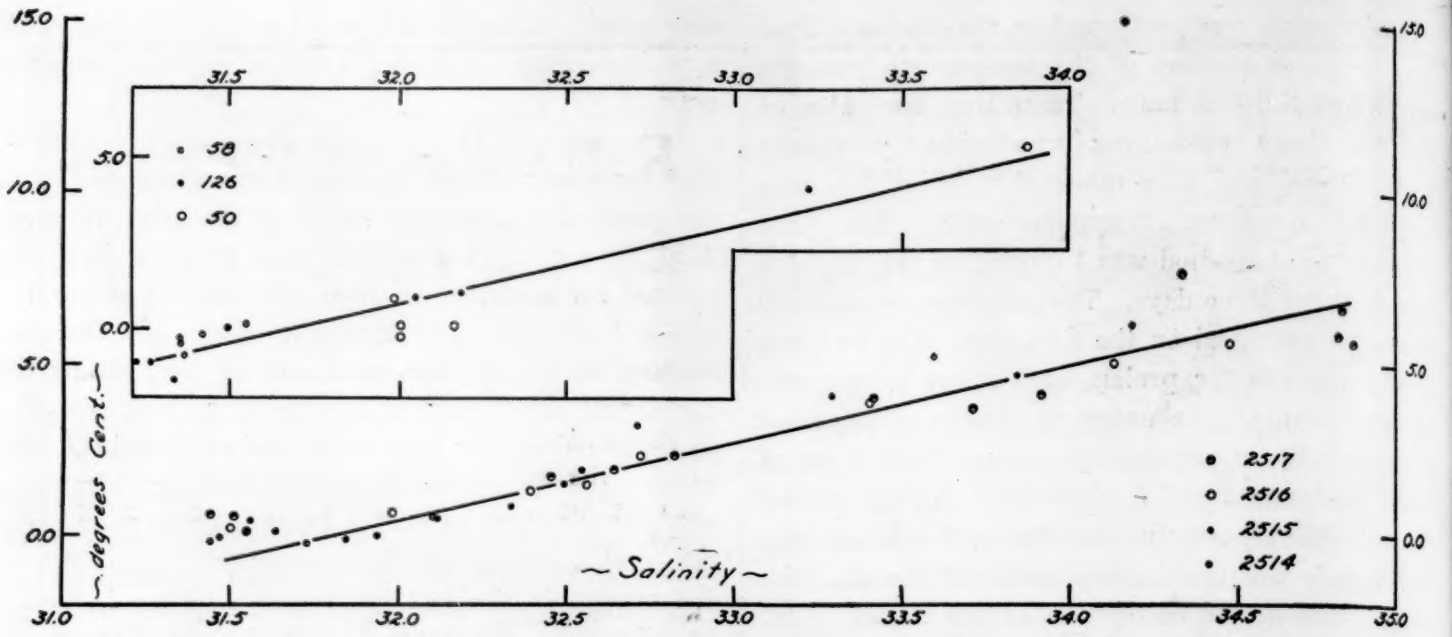

FIG. 1. T–S diagram of data from a section extending outwards from the coast in the vicinity of Halifax (station 58) to beyond the edge of the continental shelf (station 2,517).

upper seventy-five meters of water as calculated[4] are furnished in Table 1.

TABLE 1

VOLUME TRANSPORTS IN CU.M./SEC. IN THE UPPER SEVENTY-FIVE METERS BETWEEN PAIRS OF STATIONS, IN A SECTION EXTENDING FROM THE COAST (STATION 58) TO BEYOND THE EDGE OF THE CONTINENTAL SHELF (STATION 2517).

Stations	58–126	126–50	50–2514	2514–15	2515–16	2516–17
Transport	S.W. 103000	S.W. 371000	N.E. 25200	N.E. 13200	N.E. 53700	S.W. 59000

Resultant between 58 and 2517 is S.W. 441000

On the basis of the straight line relationship suggested by the T–S diagram, it may be stated that the waters of the February section are the result of the mixture of two water masses "A" and "B," which may be described as follows:

A—water, of a salinity less than 32.50% and of a temperature less than 1.0° C., and

B = water, of a salinity greater than 35.00% and of a temperature greater than 7.0° C.

The calculated resultant volume transport indicates considerable resultant movement through the section to the southwest in the upper seventy-five meters—441,000 cu.m./sec. This transport is concerned with what we have termed the A-water. The volume transport, in the upper seventy-five meters, between stations 58 and 50 is 474,000 cu.m./sec. There is a preponderance of comparatively low temperature and low salinity water between these two stations. The supply of A-water to the area depends, therefore, upon this southwest transport. The transport between stations 126 and 50 represents velocities of as much as 7 or 8 nautical mi./day. Therefore, the supply of A-B water, if produced on the Scotian shelf, is dependent upon movement, and is comparatively independent of "winter chilling in situ." This A-B water possesses the temperature and salinity characteristics of what constitutes the "cold water layer" of the Scotian shelf. It can, therefore, be readily appreciated that the most important feature of the waters of the Scotian shelf—namely, the "cold water layer"—is dependent upon "water movements from the east." This thesis will be more fully developed in a publication to follow.

[4] A. E. Parr, *Bull. Bingham Ocean. Coll.*, 6: 3, 1–62, 1937.

H. B. HACHEY

FISHERIES RESEARCH BOARD OF CANADA
ATLANTIC BIOLOGICAL STATION,
ST. ANDREWS, N. B.

BOOKS RECEIVED

American Mathematical Society, Semicentennial Publications: Vol. I, *History of the Society, 1888–1938.* RAYMOND C. ARCHIBALD. Pp. 262. Illustrated. Vol. II, *Addresses.* Pp. 315. The Society, New York.

HALL, EDWIN H. *A Dual Theory of Conduction in Metals.* Pp. viii + 170. Murray Printing Co., Cambridge, Mass. $2.00.

LANDIS, CARNEY and JAMES D. PAGE. *Modern Society and Mental Disease.* Pp. xi + 190. Farrar and Rinehart. $1.50.

LOEB, LEONARD B. *Atomic Structure.* Pp. xvi + 446. 111 figures. Wiley. $4.50.

MACARTNEY, WILLIAM N. *Fifty Years as a Country Doctor.* Pp. x + 584. Dutton. $3.50.

OBERHOLSER, HARRY C. *The Bird Life of Louisiana.* Bulletin 28. Pp. xii + 834. 45 plates. Department of Conservation of the State of Louisiana, New Orleans.

RICHARDSON, E. G. *Physical Science in Modern Life.* Pp. 256. English Universities Press, London. 8/6.

SCHMIDT, CARL L. A., Editor. *The Chemistry of the Amino Acids and Proteins.* Pp. xxiv + 1031. Illustrated. Charles C. Thomas. $7.50.